

# Solving Common Bridge Design Problems with BIM



**B**uilding Information Modeling (BIM) has revolutionized the way many construction projects are designed, built and managed—yet the bridge design and construction sector has yet to fully realize the benefits.

One of the barriers to effective BIM implementation for bridge design is a fragmented workflow. For many projects, engineers create separate bridge models (geometric, structural, analytical) and devise 2D representations of rebar detailing, quantities and geometry reporting. As there are no data links between

this information, there is an increased risk of errors and inconsistencies whenever a model or document is updated. This drastically increases the risk of discrepancies and re-work, while quickly eroding design budgets. Errors may not be detected until the project is onsite, resulting in time delays and cost overruns. Every issue that needs to be rectified wastes more time, money and materials.

However, as BIM continues to be specified by contractors and owners worldwide, BIM-compliant processes have become a necessity. With a coordinated

approach using state-of-the-art technology such as Allplan Bridge, BIM is no longer a barrier to overcoming the unique problems this complex sector presents.

## Saving Time with BIM vs. CAD

With BIM, a project can be completed more efficiently than traditional CAD design methods—often saving as much as 20% of the original schedule, if not more. This allows engineers to shift that time to the front end of the project and find more economies and efficiencies, producing a superior design compared to CAD alone. As a result, more projects can be completed in less time and to a higher-quality standard.

Losing information at every handover also becomes a problem of the past thanks to standard data exchange formats. Despite the initial learning curve, once BIM has been adopted, projects take less time and therefore cost less money.

## Maximizing Design Budgets

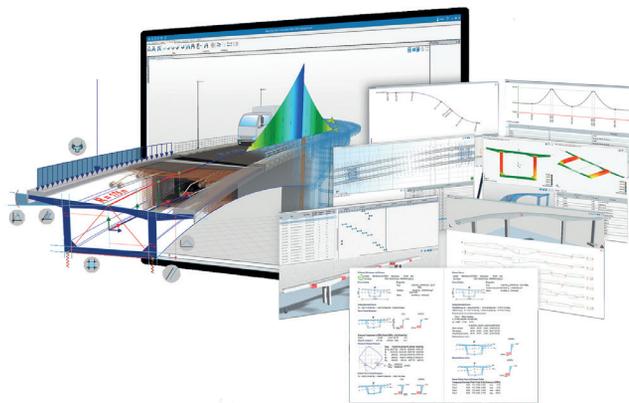
Parametric modeling is a further benefit of Allplan Bridge, making it easier to change the geometry of the design with user-specified parameters. Parametric modeling gives you more options on how you define variations between fixed data points. For example, in infrastructure projects, many of the structural elements are based on the project alignment. So linking parameters to the alignment enables change-management efficiencies, and allows designers to set variable criteria and design constraints using controlled data points.

In Allplan Bridge, this can be accomplished through a graphical interface with no need for coding knowledge, unlike other parametric modeling platforms. This core parametric modelling concept allows users to implement efficient workflows for preliminary geometric design, final geometric design, structural analysis, code-based structural design and much more. These workflows also can be linked into Allplan Engineering to refine detailing, visualizations, plan production and reporting. With more-efficient processes, design budgets can be stretched to include design optimization and detailed technical reviews, producing economical projects.

## Reducing Errors During Plan Production

On a typical bridge project, engineers create dozens of 2D plans. Every time a change is made to the initial design, each of these drawings, reports and plans must be manually updated. In Allplan, 2D deliverables are generated directly from the 3D model. Because the 2D and 3D elements are linked, as one changes, the other

updates automatically, saving time and increasing accuracy. Plan production is more efficient, as engineers and drafters can build templates that can be modified to match Department of Transport (DOT) standards and used on multiple projects.



## Supporting Enhanced Collaboration

Sharing information is another key concern. Improvements in standardized data formats—such as buildingSMART International’s Industry Foundation Classes (IFC)—have led to bridge-specific datasets which help ensure that no information is lost. Allplan Bridge—as an openBIM solution—includes these updates, so the different data formats are harmonized irrespective of the software used.

Information also can be easily imported from or exported to a wide range of BIM programs. The result is that all those involved in the project can share and obtain information at any time.

## The Solution to Digital Bridge Design

With ALLPLAN’s innovative solution, bridge engineers can create an intelligent, digital 4D model of the bridge structure, construction process, structural analysis, design and detailing. Combining the detailed geometric model and a structural analysis model in a common data environment enables projects to be completed more competitively, with less risk and greater accuracy than ever before.

BIM is no longer an obstacle to delivering safe and innovative bridges on time and to budget—it is an essential component of transparent, collaborative and cost-effective project delivery.

For more information, visit [allplan.com](http://allplan.com).

